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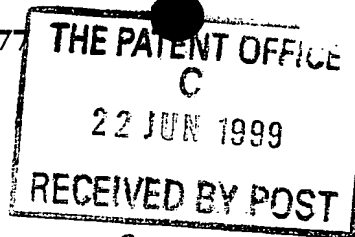
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22 JUN 1999

1. Your reference P24003/HGR/GMU

2. Patent application number
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9914418.0

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Andrew Mark Stringer
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Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

556498001 m2

4. Title of the invention

"Computer Network Payment System"

5. Name of your agent (if you have one)

Murgitroyd & Company

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

373 Scotland Street
GLASGOW
G5 8QA

Patents ADP number (if you know it) 1198013

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
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Description	19
Claim(s)	0
Abstract	0
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Statement of inventorship and right to grant of a patent (Patents Form 7/77)	-
Request for preliminary examination and search (Patents Form 9/77)	-
Request for substantive examination (Patents Form 10/77)	-
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11. I/We request the grant of a patent on the basis of this application.

Signature	<i>Graham Murnane</i>	Date
Murgitroyd & Company		21 June 1999

12. Name and daytime telephone number of person to contact in the United Kingdom
- Graham Murnane
0141 307 8400

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1 **Computer network payment system**

2

3 The invention relates to a system and method for
4 transferring payments corresponding to the supply of
5 information over a computer network. In particular the
6 invention relates to a system and method for
7 transmitting payment information between servers and
8 clients by means of a hardware infrastructure of linked
9 routers and by means of a specially adapted protocol,
10 designated for the purpose of the description of the
11 invention as a "PTP" or "Packet Tariff Protocol".

12

13 Access to the Internet is freely available everywhere
14 and the advent of e-commerce, or electronic trading, is
15 set to revolutionize the way that business is done.
16 However there remains a requirement for effective
17 trading of information itself. As the infrastructure
18 and available bandwidth expand to appropriate levels,
19 the world will become a single, on-line, global,
20 multimedia library. All public domain information will
21 be available to anyone with a network connection, via a
22 simple, easy to use interface, analogous to today's
23 Web browser application. In addition, suitable tools
24 will be developed to manage the information and tailor
25 all that is available to suit the particular needs of

1 each individual. There are two major consequences of
2 this, as follows.

3
4 Firstly, holding information locally will become
5 redundant. This means that books, CDs, prerecorded
6 videotapes and so on will eventually not be required.
7 When information is sufficiently cheap and reaches the
8 necessary levels of specificity and availability, there
9 will be no point in individuals holding local copies of
10 the information, in the form of books, CDs, tapes etc.,
11 that will quickly go out of date. They will simply
12 access the latest, updated information from its
13 original source or retrieve other data (noting that any
14 digital multimedia information is fundamentally just
15 data) from on-line archives.

16
17 Secondly, broadcast media will also become redundant.
18 Radio stations, TV channels, newspapers and journals
19 will no longer serve any purpose. Once again, highly
20 sophisticated information management tools will
21 retrieve information from the massive range of
22 disparate original sources that will come into
23 existence, with the output collated, rationalized and
24 customized to match the particular requirements of each
25 networked individual.

26
27 These changes lie in the future, but are inevitable,
28 and are likely to result in commercial upheaval and
29 colossal social changes. At present, however, there
30 remains a pressing need for a consistent and
31 appropriate system or method to permit the
32 implementation of this trade in information. The
33 system must conform to, and operate under, the
34 conditions that exist within free-market commercial and
35 national economies. It is the development of a
36 proposed solution to this problem which is addressed by

1 the present invention.

2

3 The PTP or "Packet Tariff Protocol" is an element
4 within an effective system for digital networks at
5 packet level. The protocol is envisaged as, but not
6 limited to, an evolution of the existing TCP/IP
7 standard that forms the core of the Internet as it
8 presently exists.

9

10 According to a first aspect of the present invention
11 there is provided a method of electronic payment for
12 data transferred across a computer network containing
13 at least one client, at least one server and at least
14 one router which forwards data, the method comprising
15 the steps of:

16 sending an electronic data request from a client
17 to a server via one or more routers; and

18 sending electronic data from said server to said
19 client via one or more routers in response to said
20 electronic data request, said electronic data having
21 associated with it a data field containing a value
22 which represents the commercial value of the data
23 contained within the electronic data.

24

25 Preferably the electronic data is transmitted in the
26 form of packets. Preferably each of said one or more
27 routers receives an incoming data packet, reads the
28 value in the data field associated with the incoming
29 data packet, calculates a new value based on the read
30 value and the cost of forwarding the data packet, and
31 forwards the data packet with the new value in the
32 associated data field.

33

34 Preferably each of said one or more routers checks
35 whether the value in the data field associated with the
36 incoming data packet falls within predefined parameters

1 and rejects the packet if the value falls outside the
2 predefined parameters. The parameters may depend on
3 the source of the data packet or the originator of the
4 data request.

5

6 The electronic data request may also have associated
7 with it a data field containing a value which
8 represents the commercial value of the data contained
9 within the electronic data request.

10

11 Preferably total values for transactions between
12 routers or between routers and servers/clients are
13 recorded. These total values may be used as the basis
14 for payments between the operators and/or users of the
15 routers, servers or clients.

16

17 According to a second aspect of the present invention
18 there is provided a system of electronic payment for
19 data based on a hardware infrastructure of linked
20 routers, data providers and data users, comprising:
21 at least one client;
22 at least one server for providing electronic data
23 in the form of data packets in response to a request
24 from a client and having its operation governed by a
25 server protocol which causes each data packet sent by
26 the server to have associated with it a data field
27 representing the value of the data contained within the
28 packet;

29 at least one router linked by a hardware
30 infrastructure to said server and said client and
31 having its operation governed by a routing table and a
32 router protocol;

33 whereby the router protocol causes each router to
34 add commercial value to the packet by forwarding it in
35 accordance with the routing table and to update the
36 value contained in the data field within the packet to

1 reflect this added commercial value.

2

3 Preferably the router protocol also includes procedures
4 for rejecting individual packets in accordance with
5 pre-defined parameters related to the value of each
6 packet on receipt.

7

8 The invention will now be described, by way of example
9 only, with reference to the accompanying figures,
10 where:

11

12 Fig. 1 is a schematic representation of a typical
13 generic form of a digital data packet under the system
14 of the invention;

15

16 Fig. 2 is a schematic representation of a fragment of a
17 network; and

18

19 Fig. 3 is a flow chart showing the operation of a
20 network router under the system according to the
21 invention.

22

23 The invention can best be understood by considering the
24 metaphor of the supply chain with associated added
25 value at each stage. In other words, at each step in
26 the process to supply the information, value is added
27 over and above the intrinsic value of the information.
28 Therefore, an additional cost is associated with the
29 information at each stage, until it reaches its
30 ultimate destination. In practice, this is achieved by
31 the incorporation of a "value" field into each data
32 packet, allied with network protocol extensions to
33 implement and utilize this field in the packet. This
34 is applied in a way that ultimately results in the cost
35 of providing the intrinsic information and the cost of
36 providing the transport service being enumerated and

1 accrued in the value field. These costs are thus
2 accounted for within the same system that actually
3 provides the data transport service, so that the supply
4 chain and the value chain are both incorporated into
5 the network protocols.

6
7 The value field may be augmented with a "priority"
8 field, along the lines that have already been proposed
9 by other bodies as part of existing technical
10 specifications. Within this framework though, the
11 priority field can additionally be used as part of the
12 commercial system if required, so that different
13 services can incur different costs although they may
14 share the same hardware and network infrastructure. In
15 some prior art developments, the "priority" field of a
16 data packet has evolved to serve a more advanced
17 purpose, and the field contains a code that indicates
18 how data should be handled, according to its
19 characteristics. For example, transmission of data
20 that is part of a video stream might not be re-tried if
21 it fails first time, since a degraded video output is
22 considered to be more useful to the ultimate end-user
23 than a pause to wait for all the information to achieve
24 perfect reproduction. In contrast, a file transfer can
25 usually wait for the availability of network capacity,
26 but must ultimately be one hundred percent complete,
27 accurate and checked if it is to be of practical use.

28
29 In the system according to the invention, data is
30 transferred between servers and clients in packets.
31 Fig. 1 shows the typical generic form of a digital data
32 packet under the implementation of PTP.

33
34 The packet in reality is simply data in a mutually
35 understood format. In the example of Fig. 1, it is
36 divided into three sections, which are separated in the

1 schematic representation by "X". Each section may be
2 further divided into multiple fields, which are
3 separated in the schematic by "/". The packet header
4 contains fields for addressing information etc. and in
5 the case of PTP also has what is referred to as the
6 value field. The packet tail is optional, but would
7 typically contain a checksum for the packet, or similar
8 error detection information.

9
10 Each packet of data includes a value field, which
11 contains information about the intrinsic value of the
12 data contained within the packet, and which accumulates
13 the charges made for each step in the provision of the
14 service for supplying that data packet to its ultimate
15 recipient. As an example, this aggregated overall
16 worth may be measured in Network Credit Units (NCU's).

17
18 For the purpose of applying tariffs, the network system
19 is considered to consist of "servers", "routers" and
20 "clients" although in practice a single machine or even
21 a single software application may fulfil more than one
22 of these functions at different times. For example, a
23 router can be considered to be acting as a client to
24 many servers and as a server to many clients, as
25 defined by the routing tables to which it adheres at
26 any particular moment in time.

27
28 Fig. 2 is a diagram showing a network fragment. Under
29 the system of the invention it may operate in the
30 following manner. The Web client 1 requests
31 information in the form of a message that passes
32 through Router(N) 2 and accrues added value as a result
33 of the action of the transport service. The message
34 subsequently passes through Router(A) 3 and accrues
35 more added value for the extra transport service. It
36 then arrives at the Web server 4, which responds by

1 initiating a data stream. The packets of this data
2 stream typically have intrinsic value, associated with
3 the information that they contain. The appropriate
4 component of this intrinsic value is recorded in each
5 packet. The packets then pass via Router(A) 3 and have
6 the associated value of the transport service added to
7 them. Similarly, Router(N) 2 passes the data stream
8 and adds further value to the packets for the service
9 provided. The information finally arrives at the Web
10 client 1, as required.

11

12 For each machine on the network, the net values of
13 packets received and transmitted via each hardware
14 connection can then be calculated. These values are
15 reconciled by the owners of all the machines involved,
16 as the basis for assessing the economic value of the
17 services provided and calculating the commensurate hard
18 currency exchanges required. This process is described
19 in more detail below.

20

21 In accordance with the PTP idea, the Web client, or any
22 software application functioning as a client, maintains
23 the right to reject individual packets if they are
24 deemed "too expensive" by some criteria, without
25 assuming their associated notional cost. Additional
26 control is maintained by monitoring the value of
27 incoming packets in real time, typically by summing the
28 total value arriving in the last second and/or minute
29 and/or hour and/or other time interval, as required.
30 This might, for example, be depicted by a meter
31 representation or bar indicator on a network terminal
32 screen. Over a short time period, of the order of a
33 few seconds or so, it might be acceptable to have a
34 large amount of data arriving with a large value at a
35 high rate of value accrual, for example when
36 downloading a software application. However over a

1 longer time period, of the order of an hour or so, a
2 high rate of value accrual might be unacceptable while
3 it might be acceptable to have a continuous stream of
4 data arriving with a smaller value, for example when
5 downloading a movie or video in real time. A meter
6 representation could also apply to an Internet
7 telephone, and the system could show the cost of a call
8 as it takes place, rather than the owner subscribing to
9 the service on a predetermined tariff scheme. This
10 does not preclude a service provider agreeing to absorb
11 the fluctuations in cost and passing on packets at
12 agreed rates if such a service is desired by clients on
13 the network. This might be appropriate, for example,
14 if a client actually desired predetermined costs for
15 use of the system, e.g. for budgeting purposes.

16
17 The invention is now described in more detail. For the
18 purposes of the description herein, a packet originates
19 from a server that acts as a "content provider", i.e.
20 it is the source of the data or information contained
21 within the packet that is to be transferred. This
22 piece of information and the service of providing it
23 both have some inherent worth and this worth can be
24 enumerated and written in the value field of the
25 packet. This is the first element of the system of the
26 present invention, in that content providers can attach
27 a value to the information that they provide and,
28 further, they can assert the claim to that value along
29 the same delivery channel as that by which the
30 information itself is supplied. On receipt of the
31 packet, the client (or router acting as a client) can
32 accept the packet or reject it. The control system
33 which makes the decision and determines the outcome of
34 this choice is described later. It is of importance,
35 because information cannot meaningfully be returned
36 once received.

1 Assuming that a router receives and accepts a packet,
2 it then acts in its role as a server and forwards it in
3 accordance with the routing tables it currently holds.
4 It should be noted that this always entails sending the
5 packet down a physical data connection of some sort.
6 The network is defined by the routing tables, but
7 always has a physical existence as data conduits
8 between machines. In the system of the invention, the
9 routing machine defines the worth associated with the
10 action of passing a packet from one machine to the
11 next. It might be a fixed rate, or it might be
12 dependent on the priority of the packet or on some
13 other parameters (e.g. network loading, time of day,
14 physical distance between machines, available
15 bandwidth, ownership of network infrastructure, etc.).
16 The important point is that this evaluation can be
17 resolved by the router (probably as part of its routing
18 software) as it passes the packet and that the outcome
19 of this calculation is added to the value field of the
20 packet in transition (i.e., before it is forwarded).
21 This is the second element of the system of the present
22 invention, in that network infrastructure providers can
23 attach a value to the service of transporting
24 information and, further, they can assert the claim to
25 that value along the same delivery channel as that by
26 which the information itself is supplied. It is also
27 necessary for each machine to accumulate the total
28 number of NCU's it receives from each physical
29 connection and the total number of NCU's it dispatches
30 to each physical connection, excluding those attributed
31 to packets that are subsequently rejected. It should
32 also be noted that physical connections for the receipt
33 of packets are considered to be distinct from physical
34 connections for the dispatch of packets, even though
35 they might be manifested in the same piece of cabling.
36

1 Under these conditions, the number of NCU's transmitted
2 from the machine at one end of a physical connection
3 should agree with the number of NCU's accepted by the
4 machine at the other end. These machines may be owned
5 by different organizations but, on the basis that they
6 agreed to make the trades, they should be reasonably
7 expected to have mutual interest in ensuring accuracy
8 in accounting. A commercial analogy for this would be
9 a deal done on an "open outcry" trading floor, in which
10 two parties agree a deal by signals and each makes a
11 record of it independently. The independent records
12 are reconciled at a later stage but, since both parties
13 agreed the initial deal, both are assumed to have an
14 interest in making sure that it is recorded accurately.
15 The analogy goes further, since any party that
16 establishes a reputation for not recording deals
17 accurately will simply find it impossible to establish
18 or maintain any profitable trades.

19
20 Within this protocol, any recipient reserves the right
21 to reject any packet. This rejection includes refusal
22 to accept the debt associated with receipt of the
23 packet. The most probable reason for this is that the
24 packet is deemed by some criteria to be "too
25 expensive". This act of rejection is an important part
26 of the protocol and therefore warrants detailed
27 discussion. As discussed above, once data is received
28 it cannot be meaningfully returned, since it is not a
29 physical object. On first inspection, then, it seems
30 that there would be a propensity to defraud suppliers
31 by rejecting packets (and therefore the liability to
32 pay for them) whilst still forwarding the data and
33 charging for it. However, the post-receipt rejection
34 process is vital to remove completely the possibility
35 that single "rogue" packets of massive value are
36 foisted on unsuspecting recipients. The reason that an

1 immediate breakdown of the system according to the
2 invention does not follow is because successful trading
3 requires streams of many packets of modest value to be
4 passed through the network. In the proposed scenario,
5 the "catch 'em once" price-value combination is
6 excluded by this ability to refuse to pay for
7 excessively costly packets. This means that a
8 sustainable and profitable trade will only occur with
9 the transmission of an ongoing packet stream.

10

11 This "reject" aspect of the system according to the
12 invention may best be understood by considering a "sale
13 or return" analogy. A producer (content provider)
14 creates a product (data/information) and delivers it to
15 a reseller (router) at some cost (the value in NCU's).
16 The reseller (router) either accepts it, on the basis
17 that it can be sold on (forwarded to another router or
18 an end client) at a marked up price (an addition to the
19 value in NCU's) or, alternatively, rejects it. The
20 producer (content provider) monitors the rejections of
21 the reseller (router) and decides on the basis of this
22 information whether or not to continue trading and, if
23 so, what price structure to apply. Hence, the choice
24 of acceptance or rejection of a packet is effectively a
25 "sale or return" of the data, since keeping occasional
26 packets without paying for them is of little economic
27 value. In practice, it will rapidly become the case
28 that meaningful trade in packet streams allied to
29 competitive pricing is the only way to maintain
30 profitable transactions.

31

32 Termination criteria are based upon single packet costs
33 and the cost accumulations of packets over selected
34 time intervals. Hence termination requests are issued
35 if any single packet exceeds the NCU threshold or if
36 the limits for NCU's per second, minute, hour, day

1 and/or other time interval are exceeded. The cut-off
2 levels are best kept confidential to avoid prices being
3 bumped up to the maximum that would be accepted,
4 although such information could be shared with trusted
5 counterparts in an attempt to reject packets deemed too
6 costly at an earlier stage. Note that single-packet
7 rejection is the only rejection where packets are not
8 paid for, other termination is simply a request to
9 cease supplying data. Data received before supply
10 terminates are still paid for, subject to single packet
11 criteria.

12
13 Conversely, the value attributed to data by content
14 providers could be freely advertised. This would make
15 competition between content providers more effective
16 and would also highlight expensive transport routes,
17 since the value of the packet received would have had
18 risen unacceptably when compared to the initial value
19 advertised by the content provider. Furthermore, data
20 network routing should become an extremely efficient
21 market because data transmission networks can be
22 reconfigured so easily and pricing structures changed
23 so readily. This should result in perfect competition,
24 evolving to satisfy the laws of supply and demand in a
25 free market.

26
27 The final element of the system according to the
28 invention is achieved by converting the residual
29 difference in NCU's exchanged between a pair of
30 machines over some physical connection into a payment
31 in mutually acceptable hard currency. This can always
32 be achieved bilaterally, but could also be administered
33 by some kind of clearing house with responsibility for
34 a defined physical region of the network. There is a
35 potential problem here, unless the exchange value of an
36 NCU is pegged to some hard currency. Otherwise, it

1 will float erratically as the number of NCU's per
2 network transaction can vary inversely with the
3 exchange rate to hard currency, without changing the
4 actual monetary worth of the network transaction. The
5 problem might however eventually resolve itself if the
6 NCU becomes a stable, global currency in its own right.

7
8 To complete a transaction using this system, an
9 ultimate client could first issue a request for some
10 information. For the purpose of this example only, it
11 will be assumed that this request is contained in a
12 single packet. The intrinsic value of this packet
13 would probably be zero but, in all cases, could not
14 exceed a predetermined maximum accepted by the router
15 (which may well be the machine of a network service
16 provider, acting at this point as a client). Further,
17 since this machine is probably not owned by the owner
18 of the ultimate client machine, there would be no
19 tariff added to the value of the packet. The router,
20 now acting as a server, adds a tariff to the packet and
21 passes it to the next router. This process is repeated
22 across the network until the packet reaches the machine
23 of the content provider that, somewhat confusingly, is
24 at this point acting as a client. Hence, the content
25 provider receives a request for information but becomes
26 liable for the accrued value of the packet. This value
27 will be relatively small, since it is only one packet
28 (or, more generally in practice, a relatively small
29 number of packets) and it has little or no intrinsic
30 value in its information content. It can be thought of
31 as analogous to the cost associated with a free-phone
32 telephone number that businesses commonly use to
33 attract enquiries from customers.

34
35 The machine of the content provider now acts in its
36 primary role as a server, and starts to send packets

1 addressed to the machine of the ultimate client (i.e.
2 the machine from which the original request for data
3 originated). Since the packets have content that is
4 deemed to have some worth, these packets now have a
5 significant value associated with them even as they are
6 dispatched from the server machine. As they traverse
7 the network, they will accrue further value until they
8 reach the ultimate client machine. Routers within the
9 network will have added value to packets passing both
10 ways, so that owners of these machines will be in
11 residual credit after paying for the packets received
12 and will therefore be able to reclaim hard currency
13 converted from NCU's to finance their activities. The
14 content providers will have some liabilities for the
15 receipt of the packets requesting data but will have a
16 large residual credit for supplying the information.
17 The ultimate client will contribute the majority of the
18 payments due, which cover the cost of the information
19 they receive and the cost of the process of
20 transporting it to them.

21
22 The way in which a network router might implement the
23 PTP, in addition to its existing transport protocol,
24 for the purposes of transferring data packets and
25 accumulating the associated tariffs, is illustrated in
26 the flow chart of Fig. 3. The "crow's foot" arrowheads
27 5 show possible contingencies at various stages, if the
28 required conditions are not satisfied.

29
30 For each hardware connection, the total value
31 transmitted minus the total value received (e.g. in
32 Network Credit Units) is the net profit (or loss) that
33 must be reconciled with the owner of the machine at the
34 other end of that hardware connection. This is used to
35 determine the economic value of the accumulated
36 transactions and forms the basis of the hard currency

1 exchanges necessary to finance the activities and the
2 provision of the infrastructure.

3
4 Physical network connections can be created and re-
5 arranged relatively easily and network service
6 providers can normally be changed at will. It is
7 therefore anticipated that the kind of business system
8 envisaged by the present invention will lead to a very
9 efficient market constituted of very many providers of
10 connections and routing bandwidth who serve,
11 collectively, a very large number of content providers
12 and information consumers. For example, if the
13 financial arrangements were controlled in this manner,
14 it might reasonably be envisaged that the
15 infrastructure would evolve to support video on demand.
16 This would be based upon an enormous supply of
17 material, effectively a distributed archive of all the
18 material ever produced. It would satisfy the market by
19 the laws of supply and demand.

20
21 One of the major problems associated with any data
22 distribution, and particularly digital data, is that of
23 unauthorized redistribution. Matters of privacy and
24 security are also general problems in the context of
25 the Internet. For the purposes of the description of
26 the invention, it is necessary only to consider whether
27 the use of PTP implies any changes as compared to the
28 situation at present. The system of the invention does
29 not require transfer of data in ways other than those
30 presently possible, and the proposed protocol of the
31 invention would not inhibit any of the security or
32 encryption methods used to prevent such unauthorised
33 redistribution. In fact, security and encryption would
34 be expected to take place at the level of the data
35 within the packet stream, rather than acting at the
36 packet level itself.

1 One important feature of the system of the invention is
2 that it allows consumers to choose exactly what they
3 require without having to pay for unwanted accompanying
4 material. For example, they can select one track
5 without having to pay for a complete music CD, or they
6 can decide not to view the remainder of a film if they
7 dislike the opening portion. Also, the purchase price
8 should be subject to very keen competition. These
9 facts in themselves mean that there is less temptation
10 to acquire material from illegal sources. Any legal
11 deterrents become more effective if individuals can buy
12 selectively only what they actually require, and at a
13 fair price.

14
15 In addition, as individuals are presented with, and
16 begin to utilize, the much greater choice of available
17 information, their interests will rapidly diversify and
18 their requirements will diverge. This will have the
19 effect of making it more difficult to cache data as it
20 passes through the network and resell it multiple
21 times. If content becomes sufficiently cheap, it will
22 not be worth the investment in hardware to cache it.
23 There will be less demand for any particular content,
24 so that the logistics of illegal storage for reselling
25 become more expensive and therefore less attractive.
26 This is not to say that a legal business of caching and
27 reselling popular information could not build up, still
28 within this framework. This could, for example, be how
29 what are now broadcast services continue to make money.
30 Network capacity will need a large step-change before
31 commonly required content can be served to all clients
32 from a single source, a matter which is presently
33 addressed by the use of network caches, proxy servers
34 and mirror sites on the Web. Such issues are tied in
35 with copyright and ownership of content. For example,
36 it is not generally possible for an end-user to tell

1 whether content comes from its original provider or
2 from some legitimate or illegitimate cache. Once
3 again, the implementation of the system of the
4 invention would not impact upon these matters of
5 copyright and ownership of content.

6
7 The system of the invention as described above can also
8 function with the concept of the network computer,
9 which for example means that a user might have the
10 option of purchasing the use of a software application
11 for some period rather than actually buying the
12 application outright. Once again, they receive (and
13 pay for) only what they actually require, and always
14 get the most up to date version so that rapid
15 obsolescence is not a concern.

16
17 One other important feature of the PTP concept is that
18 it can be interfaced with a conventional network,
19 operating under a different business model, provided
20 charging rates and so forth are agreed for the
21 interfaces. This means that network fragments can be
22 created or converted to conform to the PTP model as and
23 when suits the infrastructure owner, so that gradual
24 conversion is possible and a massive "roll-out" program
25 is unnecessary.

26
27 It is possible that, for effective operation, the
28 system of the invention will require international
29 financing deals and clearing arrangements, as well as
30 software controlled real-time network configuration
31 changes and real-time pricing structure changes.
32 However, the system of the invention offers two
33 significant advantages, as follows. Firstly, the
34 ultimate client always has transparent data on what the
35 service being received is actually costing, over any
36 desired time interval. This is regardless of the

1 choice of information source, network service or demand
2 driven costing changes. Secondly, PTP represent a good
3 approximation to a perfectly competitive and efficient
4 market, and one in which the costs and revenues are
5 intimately related at all stages to the actual
6 activities from which they result. These features
7 should be expected to encourage serious investment into
8 infrastructure development.

9
10 These and other modifications and improvements can be
11 incorporated without departing from the scope of the
12 invention.

13

14

15

16

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Typical generic form of a digital data packet under the implementation of PTP.

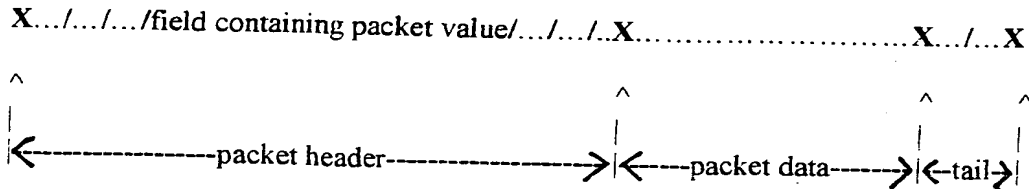


FIG. 1

Diagram showing a network fragment and an accompanying description of how it might operate under PTP.

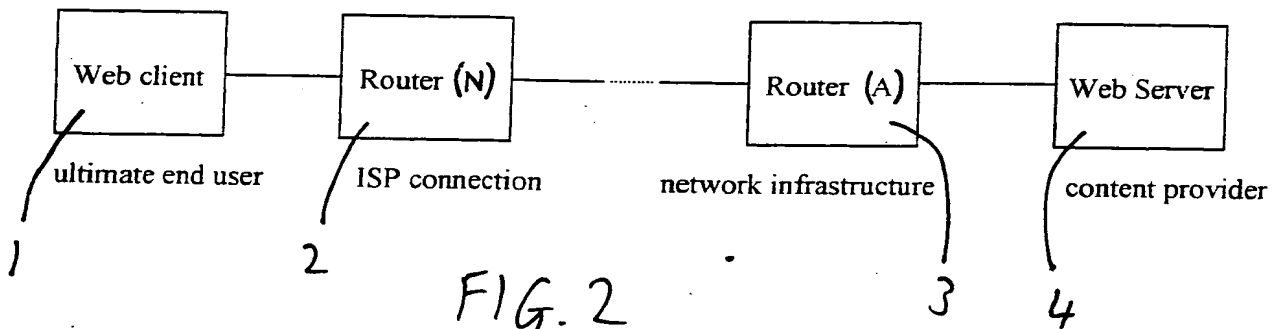
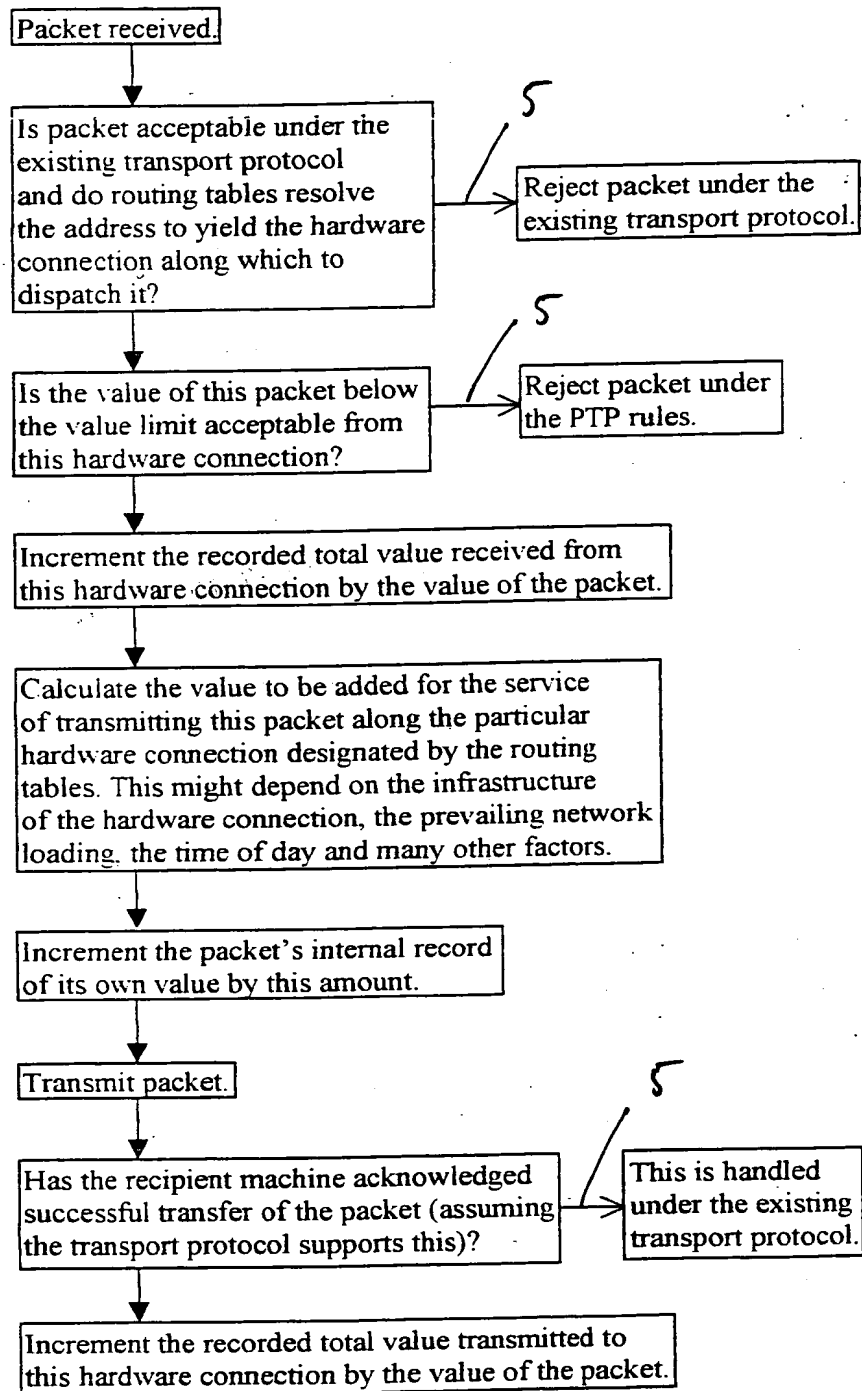


FIG. 2

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FIG. 3

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